

CLAIMS

What is claimed is:

1. A method of forming a multiple semiconductor device stack apparatus comprising:
providing a substrate;
providing a first semiconductor device having at least one bond pad on an active surface thereof;
mounting and electrically connecting said first semiconductor device to said substrate;
providing a first interposer device;
mounting said first interposer device to said first semiconductor device, on a side opposite said substrate, said first interposer device having a first surface of a first area and a second surface of second area less than said first area with a first pair of recesses formed on opposing edges of said first interposer thus exposing the at least one bond pad on the active surface of the first semiconductor device, said second surface mounted to the active surface of the first semiconductor device;
providing a second semiconductor device; and
mounting said second semiconductor device on the first surface of said first interposer device, opposite said first semiconductor device and electrically connecting said second semiconductor device to either said first semiconductor device, or to said substrate, or both.

2. The method of forming a multiple semiconductor device stack apparatus according to claim 1, further comprising:
providing a second interposer device having a first side and a second side; and
mounting said second interposer device to said second semiconductor device on said first side, wherein said second interposer device includes a bond pad recess opening for allowing connection between either said first and second semiconductor devices or between said semiconductor devices and said substrate, or both.

3. A method of forming a multiple semiconductor device stack apparatus comprising:
 providing a substrate;
 providing a first semiconductor device having at least one bond pad on the active surface thereof;
 mounting and electrically connecting said first semiconductor device to said substrate;
 providing a first thermally conductive interposer device;
 mounting said first thermally conductive interposer device to said first semiconductor device, on a side opposite said substrate, said first thermally conductive interposer having a first surface of a first area and a second surface of a second area less than said first area with a first pair of recesses formed on opposing edges of said first thermally conductive interposer device thus exposing the at least one bond pad on the active surface of the first semiconductor device, said second surface mounted to the active surface of the first semiconductor device;
 providing a second semiconductor device; and
 mounting said second semiconductor device on the first surface of said first thermally conductive interposer device, opposite said first semiconductor device and electrically connecting said second semiconductor device to either said first semiconductor device, or to said substrate, or both.

4. The method of claim 3, further comprising:
 providing a second interposer device having a first side and a second side; and
 mounting said second interposer device to said second semiconductor device on said first side thereof, wherein said second interposer device includes a bond pad recess opening for allowing connection between either said first and second semiconductor devices or between said semiconductor devices and said substrate, or both.

5. The method of claim 4, wherein said second interposer device comprises a thermally conductive interposer.

6. The method of claim 4, wherein said second interposer device comprises a thermally insulative interposer.

7. The method of claim 4, wherein said second interposer device comprises a thermally conductive and thermally insulative interposer.

8. The method of claim 3, wherein said first thermally conductive interposer device includes a thermally insulative portion.

9. A method for forming a stack of multiple semiconductor devices comprising:
providing a substrate;
providing a first semiconductor device having at least one bond pad on an active surface thereof;
mounting and electrically connecting said first semiconductor device to said substrate;
providing a first interposer device;
mounting said first interposer device to said first semiconductor device, on a side opposite said substrate, said first interposer device having a first surface of a first area and a second surface of second area less than said first area with a first pair of recesses formed on opposing edges of said first interposer thus exposing the at least one bond pad on the active surface of the first semiconductor device, said second surface mounted to the active surface of the first semiconductor device;
providing a second semiconductor device; and
mounting said second semiconductor device on the first surface of said first interposer device, opposite said first semiconductor device and electrically connecting said second semiconductor device to either said first semiconductor device, or to said substrate, or both.

10. The method of claim 9, further comprising:
providing a second interposer device having a first side and a second side; and
mounting said second interposer device to said second semiconductor device on said first side, wherein said second interposer device includes a bond pad recess opening for allowing

connection between either said first and second semiconductor devices or between said semiconductor devices and said substrate, or both.

11. A method of forming a stack of semiconductor devices comprising:
providing a substrate;
providing a first semiconductor device having at least one bond pad on the active surface thereof;
mounting and electrically connecting said first semiconductor device to said substrate;
providing a first thermally conductive interposer device;
mounting said first thermally conductive interposer device to said first semiconductor device, on a side opposite said substrate, said first thermally conductive interposer having a first surface of a first area and a second surface of a second area less than said first area with a first pair of recesses formed on opposing edges of said first thermally conductive interposer device thus exposing the at least one bond pad on the active surface of the first semiconductor device, said second surface mounted to the active surface of the first semiconductor device;
providing a second semiconductor device; and
mounting said second semiconductor device on the first surface of said first thermally conductive interposer device, opposite said first semiconductor device and electrically connecting said second semiconductor device to either said first semiconductor device, or to said substrate, or both.

12. The method of claim 11, further comprising:
providing a second interposer device having a first side and a second side; and
mounting said second interposer device to said second semiconductor device on said first side thereof, wherein said second interposer device includes a bond pad recess opening for allowing connection between either said first and second semiconductor devices or between said semiconductor devices and said substrate, or both.

13. The method of claim 12, wherein said second interposer device comprises a thermally conductive interposer.

14. The method of claim 11, wherein said second interposer device comprises a thermally insulative interposer.

15. The method of claim 11, wherein said second interposer device comprises a thermally conductive and thermally insulative interposer.

16. The method of claim 11, wherein said first thermally conductive interposer device includes a thermally insulative portion.

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